Priority Concern: Surface Water

Agricultural Runoff, Soil Erosion and Pesticides

PRIORITY CONCERN: Agricultural runoff and soil erosion

Water Management Plan Goal:
Reduce and prevent pollution from agricultural land by establishing conservation practices that minimize runoff, soil erosion and sedimentation and other pollutants.

Priority Concern

Soil erosion and sedimentation and runoff containing nutrients and pesticides are known sources of pollutants to surface water. These pollutants are transported through gully, sheet and rill erosion, tile intakes, tile lines, ditches and directly to surface water. Highly erodible soils are found along every river, stream and intermittent stream in Blue Earth County. Of the total existing cropland, one percent of the cropland is considered highly erodible. Reducing soil erosion on agricultural land requires a combination of understanding soil properties, field conditions and land management practices intended to protect the soil from wind and water. Establishing and promoting proven best management practices including buffer strips, filter strips, grassed waterways, terraces, crop residue, tillage practices, nutrient management, water retention, and other USDA-approved best management practices are priority actions in the *Water Management Plan 2008-2013.*

Priority Concern Assessment

SOIL EROSION

Soil erosion is a wide spread and well known problem associated with agricultural land use and intensive use of soils. Soil loss through erosion can also reduce soil productivity and increase agricultural production costs to individual farmers. Soil eroded from agricultural land can be transported to surface waters through direct runoff to a river, stream, ditch, lake or wetland or through in-field tile intakes to sub-surface drainage tile systems. According to the 1980 USDA *Resources Conservation Act Summary - Natural Resources Inventory of Blue Earth County,* the deterioration of surface water is directly related to sediment and ag-waste pollutants being carried by runoff, and approximately one-half of the total sediment deposited in the streams and lakes is from cropland. Soil erosion also occurs along stream banks, wooded hillsides, ravines, construction sites and anywhere soil is not protected from water and wind. Regardless of the source, all eroded soil can degrade surface water. Loss of soil through erosion and sedimentation is a water quality concern in Blue Earth County.

The reduction of sedimentation is an important issue when seeking to improve water quality. A large amount of sediment entering a stream kills aquatic plants by blocking sunlight and disrupt feeding and reproduction of many fish species by covering the gravel and natural stream bed. Heavy sediment loads gradually fill the channel which contributes to increases in flooding. Sedimentation is a problem in rivers, streams, wetlands and lakes which are outlets for small streams and ditches.

There are different types and degrees of severity of soil erosion. The USDA characterizes erosions with the following definitions:

> *Sheet and Rill*- Detachment and transport of soil particles caused by rainfall splash and runoff degrade soil quality.
>
> *Ephemeral Gully*- Small channels caused by surface water runoff degrade soil quality and tend to increase in size. On crop land they can be obscured by heavy tillage
>
> *Classic Gully*- Deep, permanent channels caused by the convergence of surface runoff degrade soil quality. They enlarge progressively by head-cutting and lateral widening.

High Priority Erosion Areas

Erosion prone soils are found throughout the County but most easily observed from the rivers. Eroding stream banks and steep slopes are relatively common along the rivers in the County. Eroding ravines and gullies are also found near or leading to most rivers. The areas with erodible land classification for Blue Earth County are shown on Map 12. Areas with highly erodible soils are generally not used for farming due to practical difficulties associated with steepness. Map 13 shows the erodible land classification of cropland in the County. As summarized in Chart 3, just over one percent of the cropland in the County is considered "highly erodible" and 3.53 percent "potentially highly erodible" according the USDA Soil Survey.

Wind erosion is also a source of sediment and soil-related pollutants. Map 15 displays the wind erodibility index for the County. The USDA does not consider wind erosion a wide-spread problem in Blue Earth County. Soils with the greatest potential for wind erosion are found mainly south and east of Lake Crystal. Drifts of wind blown soil in this area are commonly observed collecting along fence lines and ditches adjacent to broad expanses of open fields lacking crop residue or vegetation in the winter and spring. The soils with the greatest wind erosion potential are also coarse-textured soils. Map 14 displays general soil texture. A comparison of general soil texture and wind erodibility shows mucky peat and mucky silt loam soils located throughout the County have greater wind erosion potential compared with remaining soil texture classifications.

Reducing soil erosion on agricultural land requires a combination of understanding soil properties, field conditions and land management practices intended to protect the soil from wind and water. Reducing run off and soil loss can include land practices to reduce the force of wind or water, cover the soil, hold soil in place, and trap eroded soil carried by wind or water.

Some of the assessment methods that can be used to locate and monitor soil erosion and corrective/preventative actions are visual assessment, volume calculation, and aerial photo trend analysis. Visual assessments and inventories of soil erosion on a broad scale are limited by accessibility due to erosion-prone soils being located mainly on steep slopes and land-locked parcels. GIS and aerial photos can be used to help identify the worst conditions and can be useful for smaller scale studies. Use of aerial photos, typically taken in the spring and summer, is limited by tree, crop and other vegetative cover. With detailed location information and GPS corrective and preventative actions to reduce soil erosion can be monitored over time. Ultimately, farmers have the

best knowledge of erosion problems on their land and typically initiate contact with the SWCD and NRCS for technical assistance.

FEEDLOTS, MANURE AND NUTRIENT RUNOFF

Nutrient and manure management is the highest feedlot-related priority in the *Water Management Plan 2008-2013*. As a result of an intensive, unified effort by the County, SWCD and NRCS to work with landowners in the mid-1990s, there are few remaining feedlots with potential for direct runoff. The remaining feedlots with pollution potential are relatively small sites. The SWCD, NRCS and County will continue to work with the few remaining sites with pollution potential. These sites will likely require continued technical and financial assistance from the SWCD and County. Structural practices, such as diversions, storage basins, barn gutters and others, may be needed to correct runoff problems. Small sites, with fewer than ten animal units, and pastures may also require technical and financial assistance from the SWCD, NRCS and County.

Feedlots and manure management are discussed and addressed in greater detail in the Livestock Feedlot Section of the plan.

PESTICIDES

Pesticide runoff is a high priority issue related to human health, wildlife and aquatic life. Pesticide air drifting during application and carried with soil eroded by wind is another source of pesticides in surface water. Setbacks from surface waters during application help reduce this source. Vegetated buffer strips provide a physical barrier to protect the set back or impact area and can help trap and filter pollutants and wind blown soil particles.

Pollution potential is dependent on the interaction of the chemical's scientific properties and use relative to conditions such as soil, geology, topography and weather. Ultimately, the pesticide and its pollution impacts are determined to a large extent by proper use and application.

The MDA recommends best management practices for pesticide users to protect water resources, including the following as described in an MDA handout:

1. Scout field for weeds and match the management approach to the weed problem.
2. Evaluate reduced or split herbicide application rates.
3. Soil incorporate.
4. Evaluate surface drainage patterns in field and install filter strips and establish buffer zones for streams, sinkholes and tile intakes.
5. Determine the depth to groundwater in your fields and consider protective practices in vulnerable areas.
6. Rotate herbicide modes of action.
7. Consider precision application.

The MDA is the lead agency for pesticide monitoring. According to an MDA report, the MDA's surface water monitoring efforts are focused in locations where agricultural

chemicals have a relatively high potential for water resource impacts based on rainfall, runoff and direct connections between ground and surface water. The MDA has established several monitoring locations in Blue Earth County, a site on each of the following: Minnesota River, Blue Earth River, Le Sueur River, Little Cobb River, and the "Beauford Ditch."

The MPCA has proposed listing two river reaches in Blue Earth County with aquatic life impairments from acetochlor on the 2008 Impaired Waters list. Acetochlor is a corn herbicide. TMDLs are discussed in greater detail in the "Impaired Waters and TMDLs" section of the plan. MPCA fact sheets and maps related to impaired waters and TMDLs are included in the Appendix.

With limited pesticide monitoring of surface waters in Blue Earth County, the type and amount of pesticides and their impact is not understood and cannot be addressed in the context of the *Water Management Plan 2008-2013*. The County and SWCD rely on the MDA, MPCA and MDH to monitor and regulate pesticides and their impacts on human health and the environment.

LOCAL PROGRAMS

Reducing soil erosion, runoff and other agricultural related pollution is ultimately a land management decision made by land owners and operators. Successfully working with land owners and operators to address soil and water conservation and pollution problems is best accomplished at the local level with trusted and knowledgeable staff providing individual and targeted services and financial assistance. The SWCD, NRCS and County staff serve Blue Earth County landowners and many programs are in place to accomplish water quality goals.

Blue Earth County Soil and Water Conservation District (SWCD) Programs

The SWCD is responsible for education, promotion, technical assistance, establishment and monitoring of conservation practices on agricultural land. The SWCD works with many local, State and Federal government partners.

The SWCD is co-located with the NRCS and the FSA is located in an adjoining office. The NRCS and SWCD work cooperatively sharing office equipment, vehicles, technical expertise, and other support. This one-stop shopping system works well for farmers as well as staff. Farmers benefit from knowing where to consistently obtain reliable information and support from staff familiar with their land and knowledge of solutions and potential financial assistance. In Blue Earth County, a farmer's first contact for information is typically the SWCD and NRCS office.

The process of establishing conservation practices is time consuming and can involve many project partners and funding sources. Each source of funding has a set of rules and deadlines. The number and type of funding sources and program requirements has increased in the past ten years complicating the process for both the SWCD and landowners. Once a project is funded, weather, contractor availability, land owner

commitment and other factors can delay the project. The SWCD is also responsible for reporting and monitoring the life of the practice.

Education and Information
The SWCD general education and information communications provide basic information about SWCD programs, location, special projects and other information. The district uses standard communication methods including a web site, local media, guest lectures, newsletters and mailings. The County web site also provides a link to the SWCD web site. The SWCD works with the NRCS and FSA to distribute a newsletter annually. The SWCD and NRCS work with schools, local media, and conservation organizations. The SWCD also participates in SWCD/BWSR education events and promotions including the Envirothon, Soil Stewardship Program, MASWCD poster and essay contest and tours. SWCD efforts to target and contact landowners is limited mainly by staff resources.

Tree Program
Trees are available for sale to the general public, including individuals, farmers, municipalities, and land developers. About 50 tree species are available for purchase. Buyers pre-order trees between November and March, and the trees are delivered and picked up in April. Owners of CRP and CREP have been targeted for tree sales. Between 27,000 and 30,000 trees are typically sold annually. A tree planter is also available for rent from the SWCD.

Equipment Rental
The SWCD has conservation equipment available for rent to citizens, businesses and government. The equipment available for rent includes: a tree planter and a 12 ft Brillion drill for grasses, flowers and forbs.

Technical Services
The SWCD provides a variety of technical services to land owners. Technical design and approval authority for government funded projects is granted only to properly trained, certified and designated staff. The SWCD, NRCS and Zone 10 technical staff work together to provide technical resources to land owners/operators. Work load demands and seasonal conditions limit the time technical services can be conducted in the field.

Zone 10 is a SWCD joint powers organization that receives BWSR Nonpoint Technical Assistance grant program funds to hire engineering and technician staff for the purpose of assisting landowners in the installation of conservation practices. Initially the technical assistance funds supported the technical needs required for SRF loans. However, technical support for other programs dealing with conservation practices is allowed. The BWSR grant to Zone 10 does not cover the costs needed to maintain adequate engineering staff. Zone 10 charges engineering fees for services. The Blue Earth County SWCD houses and supervises the Zone 10 engineer and technical staff. Zone 10 consists of nine SWCDS, including Blue Earth, Brown, Faribault, Le Sueur, Martin, Nicollet, Sibley, Waseca and Watonwan.

Procedures for Establishing Soil and Water Conservation Practices
In accordance with the State Cost Share Guidelines, the SWCD has certain responsibilities and procedures with respect to administration of cost share funding. GBERBA also administers projects using the State Cost Share Guidelines and the

individual grant terms. Establishing conservation projects can be time consuming. It can take up to a year or more for approved projects to be constructed, depending on weather conditions, project resources and staff time. Establishing land practices generally involves the following steps:

1. Owner/operator Contact
2. On-site Investigation
3. Identify Social and Regulatory Issues
4. Prepare Cost Estimates
5. Identify Potential Financial Assistance Programs
6. Contract with Land Owner to Encumber Funds
7. Construction
8. Life Cycle Inspections and Monitoring

Land owner/operator Contact

In most cases the land owner/operator is requesting technical and financial assistance to solve a known soil erosion problem. Land owners also request information in response to an ad, press release, letter or other source of information. The SWCD/NRCS staff and land owner/operator discuss problem, look at aerial photos, etc. A site visit is scheduled if the owner/operator is interested and makes a request for assistance.

On-site Investigation

SWCD, NRCS or Zone 10 staff visit the site and determine the nature of the problem and whether it is high priority erosion or water quality problem eligible for SWCD assistance. If not eligible, the SWCD might refer the land owner to another agency for assistance. Determine which conservation or management practice(s)/system(s) are needed to effectively treat the problem. Determine if the contributing watershed (including land not managed by the land owner/operator) is a sediment source that will reduce the practice's effective life or prevent normal operation and maintenance.

Social and Regulatory Issues

Assess whether the identified solution would have adverse impacts on the cultural resources, threatened and endangered species, wetlands, or flood plains of the area. Determine whether or not the problem is related to non-compliance with existing regulations, such as a soil loss ordinance, zoning, or feedlot ordinance.

Cost Estimate

Gather information to prepare a cost estimate, including engineering costs. The landowner is typically seeking financial assistance and is usually discussed at the first meeting prior to the site visit. The SWCD tries to be aware of funding sources or programs available outside of the SWCD/NRCS/FSA in order to provide service to the land owner/operators and encourage establishment of conservation practices.

SWCD charges for technical or administrative services provided to a land occupier are not eligible costs to establish a practice. These activities should be funded by setting aside 20 percent of the grant appropriation. Ineligible costs include, but are not limited to, costs to conduct field investigations, design the conservation practice, monitor the establishment of the practice, and all program administration costs.

Conservation district service charges, including but not limited to tree planting or mechanical weed control charges, are not considered technical or administrative

services and are an eligible cost to establish a practice. In addition, the services of a consulting engineer may be an eligible cost.

Use of private engineers and consulting firms are not eligible for State cost share funding. NRCS programs allow different rates of compensation for authorized Technical Service Providers depending government or private affiliation. For example, Zone 10 engineering services are allowed half rate of private consulting firms because Zone 10 is a government-funded program.

Contract

The cost estimate and available funding information is presented to land owner/operator. The land owner/operator signs contract agreeing to establish practice. Some landowners are hesitant to sign the agreement unless they are assured they will receive funding and the project will be completed quickly. The SWCD Supervisors approve contract to encumber project within the terms of the applicable grant.

SWCD oversees construction and verifies construction with paid invoices. The SWCD Board approves payment to land owner/operator. For GBERBA projects, the payment of the project must also be approved by the GBERBA Technical Committee and Policy Board and payment is then made to the land owner/operator.

Maintenance and Life Cycle Inspections

The land owner/operator is responsible for the operation and maintenance of practices to ensure that their conservation objective is met and the effective life, a minimum of 10 years, is achieved. The SWCD must complete practice site inspections at the end of the first, fifth, and ninth years following the certified completion of the conservation practices with a minimum effective life of 10 years.

Within the limits of available resources, the SWCD is also expected to help land owners schedule their operations and maintenance activities, to advise land owners on operation and maintenance techniques, and make engineering surveys and designs for maintenance when needed. In addition, inspect conservation practices for damage after storms producing unusually heavy run off. The SWCD can perform additional site inspections on a case-by-case basis, but with limited staff time, the SWCD generally responds to inquiries from landowners who discover problems.

The SWCD provides ongoing maintenance service and administrative assistance for the RIM and CREP program easements. CREP Land owners continue to request technical assistance from the SWCD for maintenance and repairs. Repairs are sometimes needed for damage caused by muskrat or beaver, tile drainage, or flood damage to structures in or near the floodplain. Maintenance issues such as weed control, plant and tree management, controlled burns, and other ongoing technical and maintenance needs are also handled by the SWCD. The SWCD is also responsible for the ongoing administrative paperwork associated with CREP sales and changes in land ownership. New owners of CREP land generally have questions about the program, their responsibilities and maintaining the property.

Landowner Contacts

The State Cost Share Manual and SWCD Operational Handbook recommend that SWCDs identify and contact land owners/operators with high priority erosion problems and suggests general efforts, such as distributing newsletters or sponsoring workshops,

along with more focused efforts such as personally contacting land owners/operators with high priority problems in a targeted watershed.

With staff- and project-related financial constraints, the SWCD generally works primarily with land owners/operators who make contact with the SWCD and NRCS office. The SWCD promotes program availability with annual newsletters, press releases, open houses, and the web site. Referrals from FSA, NRCS, the County and other organizations also refer land owners to the SWCD and NRCS.

Watershed projects have provided some additional staff in recent years. Unfortunately, watershed staff positions are short term, relatively low paid positions and turn-over is high. Short term positions tend to attract inexperienced candidates who require training and oversight. The local investment in training is lost as these staff as experience leads to jobs with more stable funding and greater compensation. Professional candidates with a good understanding of or experience with agricultural land management practices, economics and other factors are difficult to find.

Program Funding- Financial

There are large geographical areas (land owners/operators) with highly erodible soils and limited financial assistance available. There are increasingly more programs for the SWCD to understand and explain to land owners/operators, and each program has additional reporting and monitoring requirements requiring staff time.

Financial assistance for conservation practices are available though the SWCD from a variety of sources. Financial assistance includes cost share, incentives and low interest loans. Some of the financial assistance programs are described below.

State Erosion, Sediment Control and Water Quality Cost-Share Program
BWSR provides up to 75% of cost-sharing to landowners for installation of soil and water conservation practices.

Reinvest in Minnesota (RIM) Reserve Program
A 20-year or permanent land retirement program that pays landowners to retire marginal agricultural land. It includes wetland restoration, riparian lands, and sensitive ground water area payments, among others.

State Revolving Fund (SRF) Ag Best Management Practices Loan Program
Low interest loans are available for equipment and projects. Eligible land owners/operators use private banks for MDA-guaranteed, low interest loans.

Watershed Projects:
Program details vary by project but generally provide financial assistance for establishing soil and water conservation practices. The main funding sources are the MPCA 319, MPCA Clean Water Partnerships and BWSR Clean Water Legacy grants. These funds are often leveraged with NRCS and FSA programs. Watershed projects in the Greater Blue Earth River watershed have increased the amount of financial assistance available in some watersheds in the County.

The only consistent source of funding allocated to the SWCD for conservation practices is the annual cost share allocation from BWSR. The State cost share allocation has not increased significantly in many years even though demand increased. The SWCD has

historically filled the gap by 1) using State cost share to enhance NRCS's 50% cost share payment maximum, and 2) using watershed project funding mainly from MPCA, BWSR and Clean Water Legacy.

NRCS and FSA Programs

The rules for NRCS and FSA programs vary depending on current Farm Bill. At this time CRP and EQIP are the most commonly used programs in Blue Earth County. The following USDA programs have been available in recent years:

Conservation Reserve Program (CRP)

There are two types of CRP: Continuous CRP and General CRP. Continuous CRP has 10-15 year contracts, sign up is year round. General CRP has a limited enrollment period. Applications are ranked nationally and are not site specific based on resource concerns.

Eligible practices include:

- Grassed waterways for gully erosion
- Shelter belts (3-8 rows) and Field Windbreaks (1-3 rows)
- Filter strips to buffer streams, wetlands and some ditches with 30-120 ft grass strips
- Riparian forest buffers to establish 180' tree buffers along streams
- Wetland Restoration for manipulated wetlands
- Farmable Wetland Program for restoring 5-10 acre pothole wetlands in fields
- Grass establishments in grazed pastures containing wetlands or streams
- Hardwood tree plantings in the 100 year floodplain of perennial streams

Environmental Quality Incentive Payment (EQIP)

Cost share to establish conservation practices. Payments are flat rate payments. The Blue Earth County NRCS is allocated a specific amount each year. Contracts are scored and ranked. Contract length varies from 1-10 years. Types of practices include residue management, erosion control structures, terraces, nutrient management, manure storage and more.

Wetland Reserve Program (WRP)

Restores manipulated wetlands back to original extent and set aside in a 10 year, 30 year or permanent easement. Cost share percentage varies depending on length of easement.

Grassland Reserve Program (GRP)

Restores and protects existing pasture land.

Wildlife Habitat Incentive Program (WHIP)

Cost share to provide assistance to enhance or create wildlife habitat. Contract length is five to ten years. Types of projects include fish stream improvements, wildlife openings, and others.

Conservation Security Program (CSP)
The primary goal of this program is not to correct resource problems or concerns but to supports conservation stewardship by rewarding landowners who have a maintained or are willing to improve their level of conservation.

The SWCD maximizes the number of projects completed by combining NRCS and SWCD administered program funds. At one time, the NRCS paid 75% cost share for conservation practices. This amount was reduced to 50% many years ago. As land owners/operators continued to expect 75% cost share assistance, water quality grants and BWSR State cost share funding were used to fill the gap to maintain this level of cost share. Many of the watershed projects leverage the landowner's 25% cash match and NRCS program funds to maximize the funding available and increase the total number of projects. The EQIP program recently started a flat rate payment system. This further complicates the process and increases the SWCD's responsibilities as other payments continue to be made on a percentage basis, typically paying up to 75%.

The SWCD's project budgets are complicated and variable. The SWCD must encumber projects for a period of time determined by the available grant. Unspent funds must be returned. Accurate cost estimates are important to ensure full utilization of available program funds. The terms, eligible projects and other requirements vary between and among water quality programs, soil and water conservation programs and NRCS programs. For some projects, several sources might be used in varying percentages depending on the maximum payment allowed, program eligibility and other factors. For example, if a part of a project is not eligible for payment from an NRCS program, another source might pay 100% for that part of the project but less on another part of the project as long as the payments do not exceed 75% of the project costs.

Watershed Partnerships and Projects

The Greater Blue Earth River Basin Alliance (GBERBA) serves mainly as a means to obtain funding to the SWCD for land owner/operator cost share and financial incentives.

Currently the County and SWCD are involved with several watershed projects. All of these projects focus mainly on agricultural best management practices, including water retention. Most have been funded through GBERBA.

Crystal Lake- This is a CWP- and CWL-funded project sponsored by the City of Lake Crystal. The SWCD manages the CWL funds, is the TSP for the project and participates in project committees. The County participates in project committees. The project is managed by the Water Resources Center at MSU-Mankato.

Maple River – This Phase II CWP Extension expires in 2009. A Maple River Coordinator is employed by the SWCD. The SWCD manages this County-sponsored CWP project.

Cobb River – This is a GBERBA project that expires in 2010. The SWCD supervises the Zone 10 Engineer and staff, including the Cobb River Technician.

TMDLs – As GBERBA members, the SWCD and County participated in the Greater Blue Earth Fecal TMDL, prepared by the Water Resources Center at MSU-Mankato and the MCPA. As described in the Impaired Waters and TMDLs Section of the plan, there will likely be more TMDL projects affecting the SWCD and County.

While working with other Counties to access additional grant funding for incentives and cost share on a watershed basis has added to the amount of funding available for local land owners/operators, there are problems with this approach. First, watershed-based funding is limited to only select watersheds in the County even though there are impaired waters and highly erodible land in every watershed in the County. Second, local staff workloads are increased directly and indirectly as watershed projects require involvement of local staff for technical assistance, education, provision of data, training and other support. Third, watershed projects have inconsistent and variable funding levels which do not allow for the addition of staff to address project and local needs. Finally, funding for technical staff is paid as a percentage of a finished project which, in order to maintain staff, necessitates focus of promotion and outreach to popular practices rather than the most effective practices.

SOIL and WATER CONSERVATION PRACTICES

Filter strips and buffer strips are likely the most widely accepted, commonly used conservation practice in the County. Filter strips reduce the movement of sediment, sediment absorbed nutrients, dissolved nutrients, pesticides, pathogens and particulate organics toward sensitive areas. Filter strips may also provide habitat for wildlife and beneficial insects. Conservation practices include, but are not limited to:

Critical Area Stabilization / Critical Area Planting: Establishing permanent vegetation on sites that have or are expected to have high erosion rates, and on sites that have physical, chemical, or biological conditions that prevent the establishment of vegetation with normal planting practices.

Diversion: A channel constructed across the slope with a supporting ridge on the lower side.

Field Windbreak and Shelterbelt**:** Linear plantings of single or multiple rows of trees or shrubs or sets of linear plantings.

Grassed Waterway: A natural or constructed channel that is shaped or graded to required dimensions and established in suitable vegetations for the stable conveyance of runoff.

Lined Waterway or Outlet: A waterway or outlet having an erosion-resistant lining of concrete, stone, or other permanent material.

Livestock Waste Management: The application of eligible conservation practice components to improve water quality associated with livestock wastewater and runoff.

Filter Strip: A strip or area of herbaceous vegetation situated between cropland, grazing land, or distributed land (including forest land) and environmentally sensitive areas.

Sediment Basin: A basin constructed to collect and store debris or sediment.

Pond: A water impoundment made by constructing a dam or an embankment or by excavating a pit or dugout.

Grade Stabilization Structure: A structure used to control the grade and head cutting in natural or artificial channels.

Water & Sediment Control Basin: An earth embankment or a combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin.

Streambank and Shoreland Protection: Using vegetation or structures to stabilize and protect banks of streams, lakes, estuaries, or excavated channels against scour or erosion.

Stripcropping: Growing row crops, forages, small grains, or fallow in a systematic arrangement of equal width strips on or near the contour of the field slope. A strip of grass or grass/legume or small grain is alternated with a strip of tilled annual crop or fallow.

Terrace: An earth embankment, or a combination ridge and channel constructed across the field slope.

Unused Well Sealing / ***Well Decommissioning:*** The sealing and permanent closure of a water well no longer in use.

Crop residue management: Leaving crop residue from last year on the soil surface by limiting tillage. Includes no-till, mulch till and ridge till.

Nutrient management: Nutrient management is managing the amount, source, placement, form, and timing of the application of plant nutrients and soil amendments.

Tree planting: Establishing woody plants by planting seedlings or cuttings, direct seeding, or natural regeneration to provide erosion control, reduce pollution of air or water, provide or enhance wildlife habitat, to provide energy conservation, to uptake water or nutrients, and other purposes.

Crop rotation: Growing crops in a recurring sequence on the same field to reduce sheet and rill erosion, erosion from wind, maintain or improve soil organic matter content, manage the balance of plant nutrients and manage plant pests.

Pest management: Utilizing environmentally sensitive prevention, avoidance, monitoring and suppression strategies, to manage weeds, insects, diseases, animals and other organisms (including invasive and non-invasive species), that directly or indirectly cause damage or annoyance.

Rotational grazing: Planting forage using grazing rotation among different fields to maximize produce and reduce sediment and nutrient runoff.

IMPLEMENTATION PLAN
Agricultural Pesticides

Water Management Plan Goal:
Reduce and prevent pollution from pesticides and runoff from agricultural land.

GUIDING PRINCIPLES for PESTICIDE MANAGEMENT:
» Agriculture is important to the economy of Blue Earth County.
» Pesticide sales and use regulation is the responsibility of the Federal and State government.
» Pesticide regulation is pre-empted by the State of Minnesota.
» The Minnesota Department of Agriculture is responsible for monitoring surface and ground water for pesticides.
» Pesticides can pollute surface and ground water.
» Pesticides can be harmful to human health and wildlife.
» Runoff containing pesticides can be minimized with best land management practices as recommended by the Minnesota Department of Agriculture.

ONGOING ACTIVITIES:
Regulation and oversight of pesticide use is not an activity of Blue Earth County, SWCD or other units of local government in Blue Earth County.

WATER MANAGEMENT PLAN:
Agricultural use of pesticides is regulated exclusively by State and Federal Government. Pesticides can be a source of pollutants. Preventing and reducing run off is a high priority. Working to reduce runoff with buffer strips and other best land management practices will be the most important action related to pesticide pollution.

The County and SWCD lack the expertise to provide a strong presence with respect to water pollution from pesticides. MPCA TMDL reports for acetochlor will likely give better direction and awareness of pesticide pollution. In the meantime, the SWCD and County will focus on land practices and education to address runoff, including pesticide runoff, as a priority concern.

The land related BMP's recommended by the MDA includes: evaluating surface drainage patterns in field and installing filter strips and establishing buffer zones for streams, sinkholes and tile intakes. Establishing buffer and filter strips is a BMP recommended to address many pollutants and are a strong component of the *Water Management Plan*. The County will focus its efforts on promoting and establishing these land management practices.

IMPLEMENTATION PLAN
Agricultural Runoff, Soil Erosion and Pesticides

Water Management Plan Goal:
Reduce and prevent pollution from agricultural land by establishing conservation practices that minimize runoff, soil erosion and sedimentation and other pollutants.

GUIDING PRINCIPLES:
» Protecting soil from erosion and maintaining soil productivity is important for the agricultural economy.
» Runoff from agricultural land can contain excess nutrients, pesticides and other pollutants.
» Soil and water conservation benefits land owners and the public by reducing erosion, sedimentation, water pollution and damages from flooding.
» Filter and buffer strips, as well as other agricultural best management practices, provide a numerous soil and water conservation services by reducing many types of pollutants.
» Water retention practices reduce flooding impacts and may provide ground water recharge.
» High priority erosion areas are found in every watershed in Blue Earth County.
» Best management practices addressing multiple natural resources needs, including water quality, wildlife, source water protection and recreation, are a cost effective and important approach to protecting and providing for long term health, safety and welfare of the public.

ONGOING ACTIVITIES:
The Blue Earth County SWCD will continue to manage and participate in soil and water conservation programs, provide technical assistance to landowners, students, agency staff, wildlife conservation organizations, and others within the constraints of limited staff and financial resources. The SWCD will continue to work closely with the NRCS and FSA and leveraging financial resources where practical and appropriate. The SWCD will continue the tree sales and conservation equipment rental programs, rain gauge network, tillage transect survey, various general education and communications programs.

WATER MANAGEMENT PLAN:
Public awareness and participation will be enhanced to support new programs and priorities set at the local level and State level. New outreach efforts are planned to target information, landowner assistance and establish proven conservation practices. The County will be supplying LIDAR, aerial photos and GIS to the SWCD. Use of these tools by both the County and SWCD will greatly enhance the local capacity to effectively assess, target and prioritize restoration efforts in accordance with local plans and in response to emerging information, plans and priorities at the watershed and State level.

In accordance with State policy, the County and SWCD will identify highly erodible crop land adjacent to public waters. Establishing vegetation on highly erodible crop land adjacent to public waters and drainage ditches will be a high priority.

> **MN Statute 103A.209 Marginal, Erodible Land Retirement Policy.**
> It is state policy to encourage the retirement of marginal, highly erodible land, particularly land adjacent to public waters and drainage systems, from crop production and to reestablish a cover of perennial vegetation.

Priorities will be determined at the local level through the Water Management Plan, SWCD annual plan, local comprehensive natural resource plans, landowner needs, and State plans. State and regional basin and water plans, TMDLs and other natural resource plans will also be used to set priorities at the local level.

Inadequate financial resources limit the ability of the SWCD to perform conservation outreach programs and services to land owners/operators on a County and watershed basis. The SWCD currently employs two staff positions, a District Manager and Office Technician. Additional, stable funding is needed for both staff and project resources to accomplish Water Management Plan goals, manage projects and complete the planning, monitoring and reporting tasks increasingly required with new programs, TMDLs and watershed projects. State grants for Zone 10 engineering assistance is needed to provide technical assistance for project development. The number of TMDLs is expected to increase in the planning period. Each MPCA TMDL and watershed project requires participation of local staff at the SWCD and County for planning, providing data and implementation. BWSR, DNR, USFWS and others are also partners with meaningful projects and studies that require local involvement for success.

Objective 1: Reduce the amount of farmed, highly erodible land adjacent to public waters and ditches by establishing a buffer strip or a cover of perennial vegetation adjacent to all public waters in the County.

Objective 2: Increase best management practices on farmed, highly erodible and potentially highly erodible land.

> **Action 1:** The County, SWCD and other local implementation partners will identify marginal, highly erodible farmland adjacent to public waters and drainage systems and highly erodible and potentially erodible farm land.
>
> **Action 2:** Identify and prioritize areas to work based on appropriate financial incentives, easements, and regulations, special projects, studies, TMDLs, and local plans related to objective.
>
> **Action 3:** Work with relevant implementation partners to promote conservation practices in priority areas.
>
> **Action 4:** Contact and work with land owners and land occupiers to establish conservation practices achieve objective.
>
> **Action 5:** Establish soil and water conservation practices to reduce runoff, soil erosion and sedimentation.

Objective 3: Increase public awareness of soil and water conservation issues, problems and solutions with education and information.

Action 1: Develop posters and other informational pieces related to soil erosion and other factors used to prioritize local project implementation and funding for display at the County SWCD, NRCS and other related offices.

Action 2: Provide access to aerial photos, maps, topography, soils and other information on the County and SWCD web sites.

Action 3: Promote best management practices in newsletters, web sites, press releases and brochures distributed by the County and SWCD annually.

Objective 4. Bi-annually review and evaluate data and information available for targeting BMP's and other implementation efforts.

Action: Regularly hold *Water Management Plan* meetings with local implementation partners to identify, assess, evaluate and prioritize current project needs, information and future implementation strategies.

Objective 5. Seek stable funding for at least one SWCD staff position to work in all priority areas coordinating and promoting best management practices as described in the *Water Management Plan 2008-2013,* watershed and other relevant plans.

Action1: Develop description of project and staff needs based on annual SWCD plans and other plans.

Action 2: Add a full-time SWCD Technician/Coordinator to:

- Work with land owners/operators in areas with high priority erosion problems coordinating and promoting proven soil and water conservation practices with targeted efforts such as personal contacts, tours and other activities.
- Work with conservation partners promoting and coordinating the establishment of buffer and filter strips on County ditches, tile intakes and other waterways with an emphasis on County ditches. Increase the total miles of drainage ditch buffer strips on County ditches in Blue Earth County by 50 percent.
- Work with land owners/operators in all impaired waters and TMDL Implementation Plan priority areas to establish soil and water conservation practices known to address multiple pollutants causing impairments.